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Twice as smart behavior of tert-butylthiacalix[4]arene derivative in glassy and crystalline form

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Abstract

© the Owner Societies 2015. A studied tert-butylthiacalix[4]arene derivative with four N-(--acetoxyethyl)carbamoylmethoxy substituents on its lower rim in partial-cone configuration (calixarene 1) can remember its previous treatment in three essentially different ways by the formation either of a molecular glass or two metastable polymorphs after heating or the removal of an included guest molecule. Guest-induced memory is very selective with a polymorph created only after the release of a few included guests among a large series of those studied and is detected via an exothermic transition. Along with ordinary properties, like glass transition, curing and cold crystallization, the molecular glass from 1 is selective due to its ability to crystallize in solvent vapors and vapor mixtures over a well-defined concentration range. Being cooperative, this property may be used for the visual detection of ethanol content in water solution when it reaches a threshold value.

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